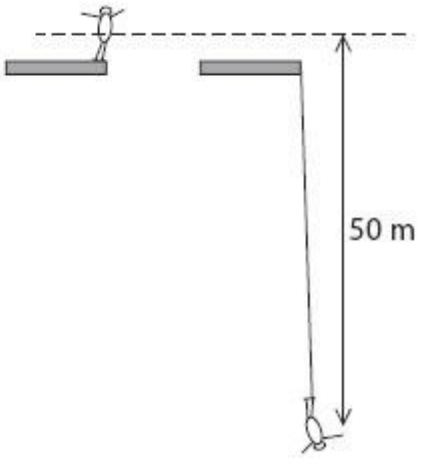
Practice Question Set For GCSE
Subject : Physics
Paper-1 Topic : 2_Motion and Forces

Name of the Student:_____
Max. Marks : 21 Marks **Time : 21 Minutes**

Q1.

A 60 kg student weighs 600 N.
He does a bungee jump.



The bungee cord becomes straight and starts to stretch when he has fallen 50 m.
Complete the sentence by putting a cross (☒) in the box next to your answer.

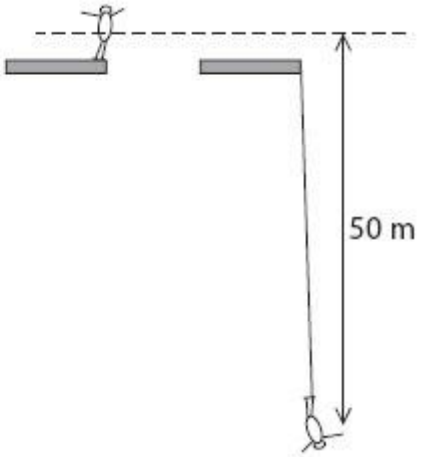
When his speed is 10 m/s his momentum is

(1)

- ☒ **A** 600 kg m/s
- ☒ **B** 3 000 kg m/s
- ☒ **C** 6 000 N m/s
- ☒ **D** 30 000 N m/s

Q2.

A 60 kg student weighs 600 N.
He does a bungee jump.



The bungee cord becomes straight and starts to stretch when he has fallen 50 m.

(a) Complete the sentence by putting a cross (■) in the box next to your answer.

He first stops moving

(1)

- ☒ **A** before all the energy has disappeared
- ☒ **B** before the bungee cord starts to stretch
- ☒ **C** when the bungee cord is stretched the most
- ☒ **D** when the elastic potential energy is zero

(b) Complete the sentence by putting a cross (■) in the box next to your answer.

When his speed is 10 m/s his momentum is

(1)

- ☒ **A** 600 kg m/s
- ☒ **B** 3 000 kg m/s
- ☒ **C** 6 000 N m/s
- ☒ **D** 30 000 N m/s

(c) (i) Calculate the change in gravitational potential energy as the student falls 50 m. Give the unit.

(3)

.....

(ii) State at what point in the bungee jump the student has maximum kinetic energy.

(1)

.....

.....

(iii) Explain why his maximum kinetic energy is likely to be less than your answer to (c)(i).

(2)

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(Total for Question = 8 marks)

Q3.

Figure 6 shows a different velocity/time graph.

This straight line graph can be represented by the equation

$$y = mx + c$$

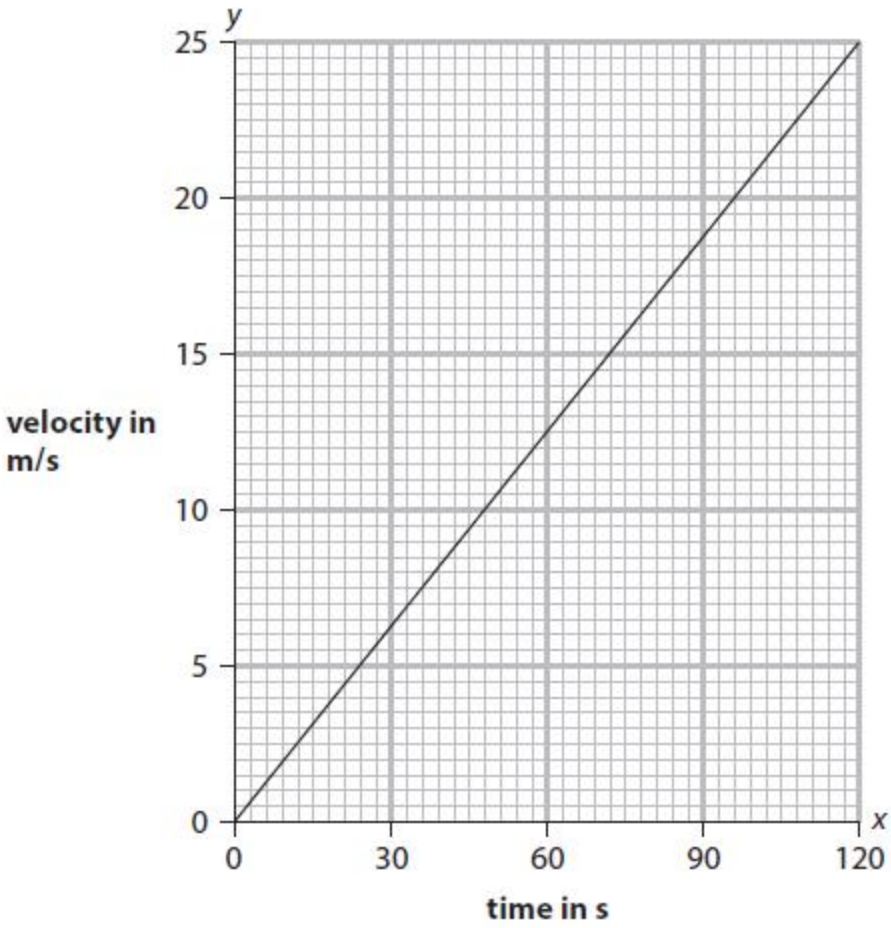

Figure 6

(i) Give the quantities that *x* and *y* represent in the equation.

(1)

x represents .....
y represents .....

(ii) Calculate the value of *m* from the graph in Figure 6.

(2)

m = ... m/s^2

(iii) State the value of *c* from the graph in Figure 6.

(1)

value of c = ...

(Total for question = 4 marks)

Q4.

A student has some cupcake cases.

One cupcake case is shown in Figure 1.

(Source: © Anton Starikov/Shutterstock)

Figure 1

The student drops a stack of cupcake cases with the base facing downwards, as shown in Figure 2.

(Source: © Elena Schweitzer/Shutterstock)

Figure 2

The speed of the falling stack of cupcake cases depends on the number of cupcake cases in the stack.

(i) The student also has a stop clock and a metre rule.

Describe an investigation to show how the speed of the falling stack of cupcake cases depends on the number of cupcake cases in the stack.

(4)

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(ii) A stack of cupcake cases has a mass of 0.005 kg.

Calculate the weight, in newtons, of the stack of cupcake cases.
Gravitational field strength = 10 N / kg

(2)

Use the equation

$$W = mg$$

weight = ... N

Figure 3 shows a cupcake case that is falling at a constant velocity.

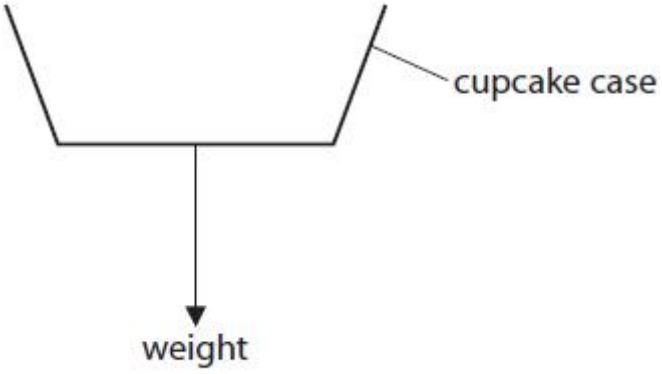

Figure 3

(iii) Draw an arrow on Figure 3 to show the force due to air resistance on the cupcake case.

(1)

(iv) State the value of the acceleration of the cupcake case when it is falling at a constant velocity.

(1)

.....

(Total for question = 8 marks)